J. Volney Lewis. Pp. v+151. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1913.) Price 6*s.* 6*d.* net.

(1) MR. SWAINE'S book represents extensive reading in geological reports and journals, some of which are not easy to procure. The references to authors require some correction—T. C. Chamberlin, for instance, is consistently quoted as "Chamberlain"—but they are well chosen and are thoroughly suggestive to the student. Thanks to this free acceptance of the results obtained by field observers in many lands, a great deal of stratigraphical information is to be found within these pages. The author, however, is possessed by an idea, which forms the undercurrent of the book, and must appear somewhat startling to petrologists, if not also to biologists. He holds that the "globes of condensed vapour" (p. 9) that occur in nebulæ pass into a liquid state, producing, if we read aright, globes of water in which certain elements are dissolved.

Through the development of protoplasm in this water, and the withdrawal of the elements from solution by organisms seeking to form hard parts, a rain of mineral matter descends, and a stony nucleus is built up from the centre outwards. Calcium carbonate cannot exist in great oceanic depths, and consequently the first deposits were siliceous, and were followed by calcareous matter, similarly arising from the tests of organisms. The red clays of deep seas represent material intermediate between these types; but the chemical actions required to produce them from shells are admittedly obscure. Wherever deep oceanic basins existed during geological times, the same order of deposition has been followed (pp. 19—21); the quartzites and sandstones in such cases, which in reality mark the first sediments in a sinking area, are regarded as formed from radiolaria in a great persistent hollow which has gradually become infilled. The calcareous oozes thus represent the latest and shallowest stage.

The application of this theory to the Upper Cretaceous series of Europe (p. 22) leads to a very confused argument. Terrigenous deposits are recognised at the base, and yet these are used to support the statement that "the $CaCO_3$ decreases with the depth." Petrological examination would have kept the author from many unjustified suggestions, such as that in regard to laterite (p. 198), which is treated, in spite of an abundant literature, as an oceanic ooze. The book is obviously not a safe one for beginners, though its illustrations and mode of production go far to commend it to the reader.

(2) Prof. Tornquist's introduction to geology is of a very different order. He also reaches a description of oceanic sediments on his tenth page, and interestingly refers to Philippi's suggestion that in past times, when no polar ice-caps existed to produce unfavourable coldness, calcareous organic deposits could be formed over the deep-sea areas in general. As is fitting in a work emanating from Königsberg, the rocks of the "Eozoicum" find their type in the admirable exposures of Fennoscandia; but the absence of many formations from eastern Prussia enables the author to be wisely eclectic. Due prominence is thus given to the Silurian strata of Wales and of Bohemia; the Permian and Triassic systems receive far more adequate treatment than is usual in English text-books; and we have a good account of the Jurassic rocks of central Germany. On the other hand, we may feel that four lines (p. 222) form an insufficient reference to the Cretaceous beds of northern France and England. The earth-movements in the Harz area in Cretaceous times are illustrated on p. 227, and are shown to be forerunners of the "Saxon folding" that accompanied the formation of the Alps. On p. 263, the essentially modern nature of Europe is well expressed. The illustrations are excellent, and include the skeleton of *Allosaurus agilis* from the American Museum in New York. We should have liked some reference to the gnawed bones of the prey in this most terrible of zoological reconstructions.

(3) Prof. Lewis's manual may be regarded as convenient by those to whom the well-known work of Brush and Penfield seems unduly large. It follows similar lines and covers a wide field, and such recently discovered minerals as benitoite and purpurite are introduced. In every case references are given to the two text-books by J. D. and E. S. Dana.

G. A. J. C.

OCEANOGRAPHIC RESEARCHES.

Scientific Papers. By J. Y. Buchanan, F.R.S. Vol. i. Pp. xii+15 papers. (Cambridge: University Press, 1913.) Price 10*s.* 6*d.* net.

THE numerous expeditions which have explored the depths of the sea since the voyage of H.M.S. *Challenger* during the years 1873–76 have added much to our detailed knowledge of the conditions occurring in various seas and oceans, and in certain cases have given some idea of the periodic and irregular physical changes which take place. But the great pioneer voyage remains the only one which has surveyed the whole world of waters, and it is remarkable how little the work of more recent years, with all its advantages of previous experience and more adequate

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resources, has modified the broad outlines of the *Challenger* results. It is of fundamental importance to the history of oceanography that the record of these early investigations should be made accessible once for all by the best authorities; those authorities, to wit, to whom the researches themselves were originally due. This has, of course, been done in great measure in the published narrative and reports of the *Challenger* Expedition; but, as in all other undertakings of the same order of magnitude, there is a sort of aftermath of result, the fruit of incidental inquiries into special methods or of special subsequent opportunities arising from the original main enterprise. These collateral results are necessary to complete the historic picture, both of the work and of the men who carried it out.

It is, therefore, a matter for much satisfaction that this has now been done, in so far as the physical and chemical work is concerned, by the chemist and physicist of the expedition himself. Mr. Buchanan entered upon his work with nearly everything to plan and invent, both as regards what was to be done and how it was to be done, and he has continued and expanded it in many directions since, along lines similar in many ways to those followed on the *Challenger*. We welcome this volume of reprints of his original papers, both for historical reasons and for the permanent value of the results obtained.

Of the fifteen papers reprinted in this book, two deal with the distribution of temperature under ice in Linlithgow Loch, describing observations showing the fallacy of the belief that the temperature of the water of a frozen lake is always that of the point of maximum density. With these exceptions, they are all concerned with oceanographical matters; either describing methods and results of experiment, as in the papers on absorption of carbonic acid by saline solutions, on the composition of sea-water ice, on determinations of specific gravity, or on apparatus for deep-sea investigation generally; or else giving the results of observations in special regions of the ocean. The lectures on "Laboratory Experiences on Board the *Challenger*," and "Deep-sea Investigation and the Apparatus Employed in it," are of special historical value, as they describe in full detail the instruments and methods employed in deep-sea work from the time of Columbus up to and including the *Challenger* expedition itself.

Mr. Buchanan's work after the *Challenger* expedition was largely carried on in the cable ships of the Silvertown Company, which afforded him special opportunities for research in connection with lines of soundings on the west coast of Africa. The results are embodied in important papers on the "Dacia" shoal, on the land slopes separating continents and oceans, and on the exploration of the Gulf of Guinea. The remarkable submarine valleys running out from the mouths of the Congo and other West African rivers are described.

OUR BOOKSHELF.

Cabinet Timbers of Australia. By R. T. Baker. Pp. 186 + lxviii plates. (Sydney: Technological Museum, 1913.)

THIS work directs attention to a section of Australian timbers which is especially suitable for cabinet work, furniture, and interior decoration.

More than sixty species, belonging to twenty-one different natural orders, are described and illustrated, the natural colour and graining of each wood being depicted by the aid of colour photography. There are also excellent illustrations in black and white of furniture and interior fittings made from several of the woods.

The coloured illustrations are the feature of the book. At first sight many of them give one the impression of being thin veneers, an impression only removed by fingering the surface of the picture. The very texture of the wood is so well brought out by this process that its working qualities can almost be predicted. We have placed actual specimens alongside the prints in several cases, and the majority of them match very closely. The text is not equal to the illustrations. Each plate is accompanied by a popular description of the timber and the uses to which it can be applied but the information given is very meagre. This is followed by a condensed description of the tree in technical language which will only be understood by the trained botanist. The geographical range of each tree is given, but little is said about the supply available, which is one of the most important points for the trade.

The main object of the author, however, is to interest Australians themselves in their native timbers and bring home to them the necessity for taking steps to prevent these valuable timber trees being exterminated in the process of clearing the land for settlement. The book certainly brings out the fact that Australia possesses a rich assortment of beautiful cabinet woods exhibiting a wide variation in figure, texture, and colour, and the Empire, no less than the Commonwealth, will suffer an irreparable loss if steps are not taken to stop the present waste of this valuable heritage of natural wealth.

Marsh's Mathematics Work-book. Designed by H. W. Marsh. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1913.) Price 3*s*. net.

THIS book consists of about 250 blank unruled sheets of writing-paper of good quality, divided into two sections. Each section is fastened to the book-cover by two strong paper fasteners, so that the sheets may be removed as required. The cover is of substantial quality, having leather

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